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# ENVIRONMENTAL Fact Sheet

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## Recycling Cardboard

### Cardboard in Solid Waste

*Weight and Volume* -- Cardboard is the largest single constituent of municipal solid waste (MSW). The U.S. Environmental Protection Agency (EPA) estimates that nearly 30 million tons of cardboard containers were generated as waste in 1995. This was nearly 14 percent of the nation's MSW. Businesses are by far the largest sources of cardboard. Cardboard accounts for almost 30 percent of all commercial and industrial solid waste, and business sources generate 90 percent of all of all cardboard waste nationwide. Cardboard is less than 2 percent of residential solid waste.

Cardboard is also one of the most frequently recycled materials in MSW. EPA estimates that 65 percent of cardboard waste is currently recycled, with the result that cardboard accounts for 8 percent by weight of disposed MSW. By volume, cardboard also accounts for approximately 8 percent of all disposed MSW.

*Disposal* -- Cardboard is free of toxic or other hazardous constituents that might pose environmental or health concerns upon disposal. Cardboard is biodegradable, although like all materials it degrades very slowly in a moisture and oxygen-depleted landfill environment. Cardboard can be safely composted, and is used as a bulking agent in some leaf and yard waste, manure, and sludge composting operations. Cardboard is a valued addition to the mix of fuels combusted in waste-to-energy facilities, releasing about twice as much heat per pound as does mixed MSW, and producing little ash.

### Cardboard Recycling

*Collection, Processing, and Storage* -- The majority of cardboard recycled in the U.S. is collected and processed on-site by medium and large commercial establishments, including, for example, department stores, supermarkets, other retailers and businesses with active shipping and receiving operations. In addition, many private waste haulers (and some municipal solid waste programs) offer separate pickup of cardboard to their commercial accounts. In New Hampshire, cardboard is recycled by most of the state's municipalities.

Although cardboard can be marketed loose, it is almost universally baled before it is shipped to markets. Many businesses operate their own balers; malls and shopping centers frequently operate balers that are shared by a number of businesses. Before and after baling, moisture is the contaminant of most concern to cardboard recyclers. In addition, "Asian cardboard" -- an inferior corrugated product manufactured from low quality recycled fibers and/or rice fibers -- can be a serious contaminant in recycled cardboard loads. (Asian cardboard is generally found as

packaging for articles imported from China and Korea. It can be distinguished from higher quality cardboard by its flimsiness and characteristic pale brown or greenish color.)

*Manufacturing* -- Cardboard is a high-quality paper product characterized by long fibers and high strength. As such, it can be used as a feedstock to manufacture a wide variety of recycled paper products, including new cardboard, printing and writing papers, paper- and boxboard, paperboard tubes, cans, and drums, and many others. In a typical remanufacturing process, recycled cardboard is dropped into a water-based solution in which it dissolves, contaminants (tape, staples, dirt, etc.) are removed by gravity, floatation, or filtration, the recycled pulp is blended to produce a mix with the characteristics required for production of a specific paper product, and the pulp is pumped to a paper machine where the final product is manufactured. Additional operations may include deinking and/or bleaching. Environmentally, paper production from recycled cardboard consumes less energy, produces fewer emissions to air and water, and generates less solid waste than production of similar products from virgin fiber.

*Markets for Recycled Cardboard* -- Historically, markets for recycled cardboard have been strong, and per-ton prices have been among the highest paid for all recycled papers. As with all recyclable commodities, prices tend to fluctuate as a result of supply and demand. Municipal recycling programs and commercial establishments continue to recycle cardboard during down times in markets because of the avoided disposal costs. Buying products made from recycled materials helps to keep markets strong.

Although New Hampshire has several paper mills that use recycled cardboard, they consume only a small proportion of the supplies generated in the state. Most cardboard waste generated in New Hampshire moves through in-state or out-of-state brokers into regional paper markets. Two factors that impact marketing of recycled cardboard in New Hampshire are the state's dispersed sources of cardboard waste, and long distances to major end-use markets. Both factors have a negative impact on the economics of recycling cardboard in New Hampshire and tend to keep some generators from diverting their cardboard into recycling markets.

For More Information -- Additional information on recycling cardboard and other materials in New Hampshire is available from:

Recycling Coordinator  
NH Department of Environmental Services, Waste Management Division  
29 Hazen Drive, Concord, NH 03301  
603-271-2900  
TDD Access: Relay NH 1-800-735-2964